

REMARKS

A. INTRODUCTION

All of the pending claims describe an eye-safe transmitted beam having at least the following characteristics:

1. energy of at least 100 mJ/pulse; and
2. a pulse repetition frequency of at least 10 Hz.

The Examiner proposes to combine Segre, et al., U.S. Patent No. 3,963,347 ("Segre") and Guch, Jr., et al, U.S. Patent No. 6,580,732 ("Guch"), to yield the claimed subject matter. Specifically, the Examiner asserts that Segre discloses the 100 mJ/pulse requirement, that Guch discloses the PRF of at least 10 Hz requirement, and that Segre and Guch can be combined to meet the two requirements.

In the discussion below, Applicant demonstrates, with the supporting declaration of Dr. Scott Spuler (who is the named inventor):

1. neither cited patent discloses the 100 mJ/pulse requirement;
2. the proposed "combination" is not a combination at all; and
3. the operation of the cited systems cannot simply be modified as the Examiner suggests.

The unavoidable conclusion is that the proposed combination is improper and would not yield the claimed invention in any event.

1. Neither Patent Discloses 100 mJ/pulse

The Examiner asserts that "said optical beam" of the Segre system has a pulse energy of about 100 mJ/pulse. With all due respect, this is simply wrong.

Segre teaches that the transmitter output is pulses "of 30 nanosecond halfwidth and approximately 1 megawatt peak power." Col. 4, lines 23-26. This cannot yield a pulse energy of 100 mJ/pulse. See, Spuler declaration, Paragraph 11. If the Examiner disagrees, Applicant requests the courtesy of an explanation of his reasoning.

The Examiner cites a discussion in the background section of Segre that references lasers "operated in the 100 millijoule range." Applicant does not know what this means. Applicant respectfully submits that the Examiner cannot know either.

The Examiner asserts, with no support whatsoever, that it means 100 mJ per pulse and the “per pulse” part is just missing. However, it could mean 100 mJ per cm<sup>2</sup> and the “per cm<sup>2</sup>” part is just missing. Indeed, it is included in a discussion about intensity not pulse energy. It could also be a power parameter with the time dimension missing.

Applicant respectfully submits that the passage cited by the Examiner does not teach anything. Leastways, it does not teach the claimed system with a pulse energy of 100 mJ/pulse. In any event, if Segre et al were aware of a 100 mJ/pulse eye-safe laser, they chose not to use it in their ceilometer.

2. The Proposed Combination is Not a Combination at All.

The Examiner states, “It would have been obvious to modify Segre to use the transmitter of Guch.” Applicant notes that, if the system used the transmitter of Guch, it would transmit the beam of Guch. See, Spuler declaration, Paragraph 10. Accordingly, this is no combination at all with respect to the relevant subject matter. If the Examiner proposes to combine certain particular structure of Guch with certain particular structure of Segre, the Examiner’s proposal is not understood.

3. The Proposed Combination is Improper

Although Applicant does not understand what structure of Segre the Examiner proposes to combine with what structure of Guch, it is apparent that the Examiner intends to create a system that has a pulse energy of 100 mJ/pulse, as the Examiner asserts is disclosed by Segre, and a PRF of at least 10 Hz as recited in Guch. As set forth above, Segre does not disclose a system with an eye-safe laser having a pulse energy of 100 millijoules per pulse. However, even assuming that an Er:glass laser, as apparently contemplated by Segre, could be identified that had a pulse energy of 100 millijoules per pulse (although this is clearly not used by Segre), such a laser could not be modified to operate at a PRF of at least 10 Hz. See, Spuler declaration, Paragraph 12. As Mr. Spuler notes, the poor thermal conductivity and the relatively large amount of flash lamp pump energy required severely limits the pulse repetition frequency of an Er:glass system and the laser cannot be fired more than once every few seconds. These restrictions limit Er:glass to applications that require only low pulse energies or where rapid pulse repetition is unnecessary.

The Examiner cannot simply assert that the prior art can be combined in a manner that a skilled artisan would understand that it cannot. For example, an Examiner cannot simply cite an SUV engine that generates 600 hp and a subcompact engine that gets 60 mpg to obviate a claim for a

novel engine that generates 600 hp and gets 60 mpg. In this case, Applicant has presented evidence that the cited Patents cannot be combined as the Examiner has suggested. Applicant respectfully submits that the Examiner has not established a prima facie case of obviousness, and, in the alternative, that any prima facie case of obviousness has been rebutted.

4. Why It Matters

This is not a case where Applicant has simply given a laundry list of unrelated parameters. As set forth, for example, at Paragraphs 4-6 of the Spuler declaration, the recited parameters are precisely the parameters that are required to yield the revolutionary scanning lidar monitoring system, which has been deployed around the Pentagon adjacent to Reagan National Airport. Specifically, the high pulse energy and high pulse repetition frequency allow the lidar system to operate in a scanning mode to effectively monitor a significant volume of atmosphere in substantially real-time. Segre cannot do that. Guch cannot do that. As discussed above, those systems cannot be combined or modified to do that.

B. THE CLAIM REJECTIONS

Turning to the specific rejections, Claim 64 was rejected under 35 U.S.C. §102(b) as being anticipated by Segre. Claim 64 has been amended to include the limitation relating to a PRF of at least about 10 Hz. The Examiner acknowledges that Segre does not disclose this. Accordingly, it is believed that this rejection has been overcome.

Claims 1, 17-18 and 67-68 were rejected under 35 U.S.C. §103 as being unpatentable over Segre in view of Guch. For the reasons set forth above, it is respectfully submitted that Segre and Guch cannot properly be combined and, in any event, would not yield this claimed subject matter if combined as the Examiner proposes. Applicant therefore respectfully submits that this rejection should be withdrawn.

Claims 13-15 were rejected under 35 U.S.C. §103 as being unpatentable over Segre in view of Guch and further in view of a patent publication by Cheng. Claim 16 was rejected as being unpatentable over Segre in view of Guch and Cheng and further in view of a publication by Kurnit. Claims 2-3, 8-9, 11-12 and 23 were rejected as being unpatentable over Segre in view of Guch and Kurnit. Claim 4 was rejected as being unpatentable over Segre in view of Guch and Kurnit. Claim 5 was rejected as being unpatentable over Segre in view of Guch and Kurnit and a patent by Begley et al. Claims 6 and 7 were rejected as being unpatentable over Segre and Guch and Kurnit and further

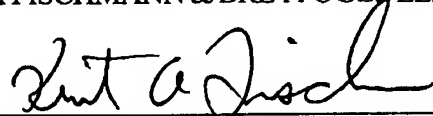
in view of a U.S. patent by Cardimona. Claim 10 was rejected under 35 U.S.C. §103 as being unpatentable over Segre in view of Guch and Kurnit in further view of Krapchev. Claims 19 and 20 were rejected as being unpatentable over Segre in view of Guch and further in view of a publication by Seo. All of these claims are believed to be allowable as depending from an allowable base claim for the reasons set forth above.

Based upon the foregoing, Applicants believe that all pending claims are in condition for allowance and such disposition is respectfully requested. In the event that a telephone conversation would further prosecution and/or expedite allowance, the Examiner is invited to contact the undersigned.

Respectfully submitted,

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